

L Number	Hits	Search Text	DB	Time stamp
-	8	CLAERHOUT	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 08:14
-	1	2001-112403.NRAN.	DERWENT	2002/07/11 10:35
-	6	((("5503468") or ("5810107") or ("5626402") or ("5620236") or ("5709435") or ("5382085"))).PN.	USPAT; US-PGPUB	2002/07/11 10:37
-	62	(laminant or laminat\$6) same (pressure or force) adj2 (sensitive or responsive) same sensor	USPAT; US-PGPUB	2003/06/18 08:25
-	5218	(laminant or laminat\$6) same (pressure or force) adj2 (sensitive or responsive)	USPAT; US-PGPUB	2002/07/11 11:39
-	0	((laminant or laminat\$6) same (pressure or force) adj2 (sensitive or responsive) ) and 303/7,123.ccls.	USPAT; US-PGPUB	2002/07/11 11:39
-	695	303/7,123.ccls.	USPAT; US-PGPUB	2002/07/11 11:39
-	0	((laminant or laminat\$6) same (pressure or force) adj2 (sensitive or responsive) ) and (303/\$.ccls. or 188/\$.ccls.)	USPAT; US-PGPUB	2002/07/11 11:39
-	0	((laminant or laminat\$6) same (pressure or force) adj2 (sensitive or responsive) ) same pad same brak\$4 same pedal	USPAT; US-PGPUB	2002/07/11 11:40
-	0	((laminant or laminat\$6) same (pressure or force) adj2 (sensitive or responsive) ) same brak\$4 same pedal	USPAT; US-PGPUB	2002/07/11 11:40
-	1	((laminant or laminat\$6) same (pressure or force) adj2 (sensitive or responsive) ) same pedal	USPAT; US-PGPUB	2002/07/11 11:41
-	153	pressure same pad same sensor same brak\$3	USPAT; US-PGPUB	2002/07/11 11:50
-	2	((("5115162") or ("4295687"))).PN.	USPAT; US-PGPUB	2002/07/11 11:45
-	3	5115162.URPN.	USPAT	2002/07/11 11:45
-	6	("3239696"   "3395485"   "4190785"   "4521712"   "4618797"   "4857887").PN.	USPAT	2002/07/11 11:46
-	462	188/112\$.ccls.	USPAT; US-PGPUB	2002/07/11 11:50
-	40	188/112\$.ccls. and time same force same (towed or trailer) same brak\$4	USPAT; US-PGPUB	2002/07/11 11:52
-	6	188/112\$.ccls. and time same force same (towed or trailer) same brak\$4 same independent\$3	USPAT; US-PGPUB	2002/07/11 12:18
-	40	188/112\$.ccls. and time same force same (towed or trailer) same brak\$4	USPAT; US-PGPUB	2002/07/11 12:19
-	1	303/7.ccls. and time same force same (towed or trailer) same brak\$4 same independent\$4 near4 (tow or tractor or towing)	USPAT; US-PGPUB	2002/07/11 12:45
-	7	303/7.ccls. and time same (towed or trailer) same brak\$4 same independent\$4 near4 (tow or tractor or towing)	USPAT; US-PGPUB	2002/07/11 12:48
-	695	303/7,123.ccls.	USPAT; US-PGPUB	2002/07/11 12:49
-	100	188/3h.ccls.	USPAT; US-PGPUB	2002/07/11 12:49
-	373	188/3h,3r.ccls.	USPAT; US-PGPUB	2002/07/11 12:50
-	850	303/20.ccls.	USPAT; US-PGPUB	2002/07/11 12:50
-	946	303/2-3.ccls.	USPAT; US-PGPUB	2002/07/11 12:50
-	462	188/112\$2.ccls.	USPAT; US-PGPUB	2002/07/11 12:50
-	2018	(tow or towing or tractor) same (trailer or towed) same brak\$4	USPAT; US-PGPUB	2002/07/11 12:51
-	125	((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) and (controller or ECU)	USPAT; US-PGPUB	2002/07/11 12:55

-	351	((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor)	USPAT; US-PGPUB	2002/07/11 12:56
-	153	((((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) ) and 188/\$.ccls.	USPAT; US-PGPUB	2002/07/11 12:56
-	80	((((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) and (controller or ECU)) not (((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) ) and 188/\$.ccls. )	USPAT; US-PGPUB	2002/07/11 13:11
-	193	((((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) ) and 303/\$.ccls. not (((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) and (controller or ECU)) not (((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) ) and 188/\$.ccls. )	USPAT; US-PGPUB	2002/07/11 13:12
-	68	((((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) ) and 303/\$.ccls. not (((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) and (controller or ECU)) not (((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) ) and 188/\$.ccls. ))) not (((tow or towing or tractor) same (trailer or towed) same brak\$4) and (pedal or treadle) same (resistor or force or transducer or resistive or sensor) ) and 188/\$.ccls. )	USPAT; US-PGPUB	2002/07/11 13:13
-	1	("6417773").PN.	USPAT; US-PGPUB	2002/07/15 09:12
-	2	"20020093245"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/04/17 08:48
-	967	brak\$4 same piezo\$8	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/04/16 13:54
-	2	"20020093245"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/04/19 14:01
-	1	"20020093245" and static	USPAT; US-PGPUB	2003/04/17 08:56
-	2087	(piezo\$8) same static	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 08:59

-	968	(piezo\$8) same brak\$4	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 08:57
-	209	(piezo\$8) same (pedal or treadle)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 08:57
-	0	((piezo\$8) same static) same ((piezo\$8) same brak\$4 ) same ((piezo\$8) same (pedal or treadle))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 08:59
-	17	(piezo\$8) same rigid\$4 same brak\$4	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 08:59
-	6	(piezo\$8) same static same brak\$4	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 09:00
-	114	((piezo\$8) same brak\$4 ) same ((piezo\$8) same (pedal or treadle))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:00
-	3	5115162.URPN.	USPAT	2003/04/17 10:22
-	1	6179390.URPN.	USPAT	2003/04/17 10:23
-	1	2001-112403.NRAN.	DERWENT	2003/04/17 10:34
-	1	2001-112403.NRAN.	DERWENT	2003/04/17 10:35
-	1	1999-304128.NRAN.	DERWENT	2003/04/17 10:35
-	1	1997-335451.NRAN.	DERWENT	2003/04/17 10:35
-	1	1997-335451.NRAN.	DERWENT	2003/04/17 10:36
-	3	5115162.URPN.	USPAT	2003/04/17 10:37
-	1	("4901055").PN.	USPAT; US-PGPUB	2003/04/17 10:38
-	4	4901055.URPN.	USPAT	2003/04/17 10:38
-	21	("3171914"   "3171917"   "3395388"   "3497871"   "3596020"   "3601796"   "3701903"   "3763975"   "3846599"   "3881078"   "3911394"   "3912892"   "3921750"   "4021775"   "4055090"   "4173012"   "4333070"   "4686503"   "4712098"   "4737767"   "4788526").PN.	USPAT	2003/04/17 10:39
-	209	((piezo\$8) same (pedal or treadle))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 10:54
-	114	((piezo\$8) same brak\$4 ) same ((piezo\$8) same (pedal or treadle))	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 10:55
-	95	((piezo\$8) same (pedal or treadle))) not (((piezo\$8) same brak\$4 ) same ((piezo\$8) same (pedal or treadle)) )	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 10:56
-	1	1999-477016.NRAN.	DERWENT	2003/04/17 10:59
-	1	1999-477016.NRAN.	DERWENT	2003/04/17 10:59
-	8665	piezo\$8 same laminat\$4	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:01

-	521	(piezo\$8 same laminat\$4) same (sensor or pressure adj sensitive)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:05
-	7	(piezo\$8 same laminat\$4) same sensor same pressure adj sensitive	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 13:28
-	521	((piezo\$8 same laminat\$4) same (sensor or pressure adj sensitive)) same (layer or layered or lamin\$7)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:08
-	3054	piezo\$8 same (layer or layered or lamin\$7) same (sensor or sensing or pressuresensitive or pressure adj sensitive)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:12
-	3	(piezo\$8 same (layer or layered or lamin\$7) same (sensor or sensing or pressuresensitive or pressure adj sensitive)) same pedal	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:10
-	15	(piezo\$8 same (layer or layered or lamin\$7) same (sensor or sensing or pressuresensitive or pressure adj sensitive)) same brak\$4	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:11
-	0	piezo\$8 same (layer or layered) same lamin\$7 same (sensor or sensing or pressuresensitive or pressure adj sensitive) same (protrusions! or projections!) same (holes! or openings! or apertures!)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:15
-	197	piezo\$8 same (layer or layered) same lamin\$7 same (sensor or sensing or pressuresensitive or pressure adj sensitive)	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:21
-	44	piezo\$8 same (layer or layered) same lamin\$7 same (sensor or sensing or pressuresensitive or pressure adj sensitive) same plate	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:16
-	9	(piezo\$8 same (layer or layered) same lamin\$7 same (sensor or sensing or pressuresensitive or pressure adj sensitive)) and 29/\$.ccls.	USPAT; US-PGPUB; EPO; JPO; DERWENT; IBM_TDB	2003/04/17 11:22
-	0	(piezo\$8 same laminat\$4) same sensor same pressure adj sensitive	USOCR	2003/04/17 13:30
-	285	piezo\$8 same sensor	USOCR	2003/04/17 13:30
-	77	piezo\$8 same brak\$4	USOCR	2003/04/17 13:31
-	40	piezo same brak\$4	USOCR	2003/04/17 13:32
-	38	piezo same (brake or braking)	USOCR	2003/04/17 13:35
-	43	piezoelectric same (brake or braking)	USOCR	2003/04/17 13:32
-	43	piezoelectric same (brake or braking)	USOCR	2003/04/17 13:32
-	0	piezosensitive same (brake or braking)	USOCR	2003/04/17 13:32
-	43	(piezoelectric same (brake or braking)) or (piezoelectric same (brake or braking) )	USOCR	2003/04/17 13:33
-	69	(piezoelectric same (brake or braking)) or (piezoelectric same (brake or braking) ) or (piezo same (brake or braking))	USOCR	2003/04/17 13:34
-	2	((piezoelectric same (brake or braking)) or (piezoelectric same (brake or braking) ) or (piezo same (brake or braking))) same pedal	USOCR	2003/04/17 13:34
-	0	((piezoelectric same (brake or braking)) or (piezoelectric same (brake or braking) ) or (piezo same (brake or braking))) same laminate	USOCR	2003/04/17 13:34

-	0	((piezoelectric same (brake or braking)) or (piezoelectric same (brake or braking) ) or (piezo same (brake or braking))) same laminant	USOCR	2003/04/17 13:34
-	5	((piezoelectric same (brake or braking)) or (piezoelectric same (brake or braking) ) or (piezo same (brake or braking))) same layer	USOCR	2003/04/17 13:34
-	0	piezo same (brake or braking) same pedal	USOCR	2003/04/17 13:35
-	48	(independently or independent) near2 (operates or operated or actuated or actuate) same (towed or trailer) near5 (brakes or braking or braked)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/04/19 12:02
-	58	(independently or independent) near2 (operates or operated or actuated or actuate) same (towed or trailer) near5 (brakes or braking or braked)	USOCR	2003/04/19 12:12
-	2	"20020093245"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/04/19 14:02
-	1	"20020093245" AND STATIC	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/04/19 14:02
-	1	"20020093245"	USPAT; US-PGPUB	2003/04/19 14:15
-	3	"6213564"	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 08:13
-	1	"20020093245"	USPAT; US-PGPUB	2003/06/18 08:14
-	0	"4146866" near2 jp	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 08:18
-	147	toyota.asn. and b60t013/66.ipc.	JPO	2003/06/18 08:16
-	147	toyota.asn. and b60t013/66.ipc. and py=1992	JPO	2003/06/18 08:16
-	147	toyota.asn. and b60t013/66.ipc. and py=1992	JPO	2003/06/18 08:17
-	13	toyota.asn. and b60t013/66.ipc. and @py=1992	JPO	2003/06/18 08:17
-	1	JP404146866A	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 08:19
-	1	4146866.URPN.	USPAT	2003/06/18 08:18
-	1	MORIKAWA.in. and ISHIKAWA.in. and TAKEBAYASHI.in.	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 08:19
-	3	(brake or braking) same (laminated or lamination) same (towing or towed)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 11:16
-	34	(brake or braking) same (laminated or lamination) near5 (pad or sensitive or pedal)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 11:13
-	1	(laminated or lamination) near5 (pad or sensitive) same pedal	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 11:13
-	0	(brake or braking) same (towing or towed) same (layers! or sheets!) near3 pedal	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 11:19
-	1	(brake or braking) same (layers! or sheets!) near3 pedal	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 11:19

-	949	(brake or braking) same (laminated or lamination)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 11:16
-	14	(brake or braking) same (laminated or lamination) same (treadle or pedal)	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 11:16
-	1	6179390.URPN.	USPAT	2003/06/18 11:17
-	17	("4295687"   "4398252"   "4804237"   "4856850"   "5076114"   "5115162"   "5294190"   "5380072"   "5438516"   "5443306"   "5449362"   "5496096"   "5503468"   "5615930"   "5620236"   "5785393"   "5800025").PN.	USPAT	2003/06/18 11:18
-	0	((("4295687"   "4398252"   "4804237"   "4856850"   "5076114"   "5115162"   "5294190"   "5380072"   "5438516"   "5443306"   "5449362"   "5496096"   "5503468"   "5615930"   "5620236"   "5785393"   "5800025").PN.) and laminant	USPAT	2003/06/18 11:18
-	0	((("4295687"   "4398252"   "4804237"   "4856850"   "5076114"   "5115162"   "5294190"   "5380072"   "5438516"   "5443306"   "5449362"   "5496096"   "5503468"   "5615930"   "5620236"   "5785393"   "5800025").PN.) and laminat\$5	USPAT	2003/06/18 11:18
-	0	((("4295687"   "4398252"   "4804237"   "4856850"   "5076114"   "5115162"   "5294190"   "5380072"   "5438516"   "5443306"   "5449362"   "5496096"   "5503468"   "5615930"   "5620236"   "5785393"   "5800025").PN.) and laminated	USPAT	2003/06/18 11:18
-	109563	laminated	USPAT	2003/06/18 11:18
-	0	((("4295687"   "4398252"   "4804237"   "4856850"   "5076114"   "5115162"   "5294190"   "5380072"   "5438516"   "5443306"   "5449362"   "5496096"   "5503468"   "5615930"   "5620236"   "5785393"   "5800025").PN.) and (layers! or sheets!) near3 pedal	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 11:19
-	0	(brake or braking) same (towing or towed) same (layer or sheet) near3 pedal	USPAT; US-PGPUB; EPO; JPO; DERWENT	2003/06/18 11:20
-	4	5115162.URPN.	USPAT	2003/06/18 11:20
-	16119	303/7.ccls. or 188/3\$.ccls.	USPAT; US-PGPUB	2003/06/18 11:22
-	937	303/7.ccls. or 188/3r,3h.ccls.	USPAT; US-PGPUB	2003/06/18 11:22
-	8	(303/7.ccls. or 188/3r,3h.ccls. ) and laminat\$5	USPAT; US-PGPUB	2003/06/18 11:24
-	4	(303/7.ccls. or 188/3r,3h.ccls. ) and piezoelectric	USPAT; US-PGPUB	2003/06/18 11:25
-	4	(303/7.ccls. or 188/3r,3h.ccls. ) and piez\$7	USPAT; US-PGPUB	2003/06/18 11:26
-	10	(brake or braking) same (sensor or transducer) same pedal same (piezo\$6)	USPAT; US-PGPUB	2003/06/18 11:27
-	7	5387898.URPN.	USPAT	2003/06/18 11:28
-	5	("3501742"   "3659260"   "4712098"   "4901055"   "4916431").PN.	USPAT	2003/06/18 11:28



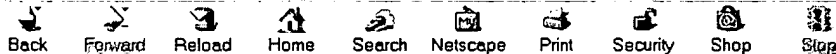
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**piezoelectricity**

appearance of positive electric charge on one side of certain nonconducting crystals and negative charge on the opposite side when the crystals are subjected to mechanical pressure. This effect is ...

**Piezoelectricity***from electricity*

Some solids, notably certain , have permanent . Other crystals become electrically polarized when subjected to . In electric polarization, the centre of positive charge within an atom, molecule, or ...

**Pierce, George Washington**

American inventor who was a pioneer in radiotelephony and a noted teacher of communication engineering.

**pyroelectricity**

development of opposite electrical charges on different parts of a crystal that is subjected to temperature change. First observed (1824) in quartz, pyroelectricity is exhibited only in crystallized ...

**Lippmann, Gabriel**

French physicist who received the Nobel Prize for Physics in 1908 for producing the first colour photographic plate. He was known for the innovations that resulted from his search for a direct ...

**Conducting properties of semiconductors from crystal**

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One entry found for **piezoelectricity**.

Main Entry: **pie-zo-elec-tric-ity**   
Pronunciation: -"lek-'tri-s(&-)tE  
Function: *noun*  
Etymology: International Scientific Vocabulary  
Date: 1883  
: electricity or electric polarity due to pressure especially in a crystalline substance (as quartz)

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Click on the example word to hear it pronounced.

\\ as a and u in <b>about</b>	\\ as e in <b>bet</b>	\\ as aw in <b>law</b>
\\ as e in <b>kitten</b>	\\ as ea in <b>easy</b>	\\ as oy in <b>boy</b>
\\ as g in <b>go</b>	\\ as th in <b>thin</b>	\\ as t in <b>the</b>
\\ as l in <b>hit</b>	\\ as oo in <b>foot</b>	\\ as oo in <b>foot</b>
\\ as i in <b>ice</b>	\\ as j in <b>job</b>	\\ as v in <b>vel</b>
\\ as a in <b>ash</b>		



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of the towing vehicle.

The force sensor may come in a number of forms. The force sensor may be a typical strain gauge, a fluid filled bladder or perhaps a spring loaded transducer.

In preferred embodiments the force sensor is a piezo-sensitive laminate.

- 5 With the use of a piezo-sensitive laminate, there is a number of advantages in the implementation of the present invention. Laminate is by nature thin being only a fraction of a millimetre thick. This means that the laminate can be placed on or in the near vicinity of the brake pedal without effecting a noticeable physical change to the brake pedal. That is, the driver of the vehicle would not notice the inclusion of the laminate when operating the brake.

Another advantage of using laminate is that it has no moving parts. This means that minimal maintenance is required (if at all).

- 15 A further advantage of using the laminate is that it does not rely on existing systems of the vehicle to operate. Therefore, this embodiment of the present invention can be readily fitted to an existing vehicle and readily comply with certification/safety checks.

In one embodiment, the laminate may fit under the brake pedal shoe which is normally a rubber sleeve that fits over the metal brake pedal.

- 20 In some embodiments the applicants provide a special designed brake pedal shoe which has a number of pressure projections which transfer the force from the driver's foot pressing on the shoe to the piezo-sensitive laminate.

The applicants have designed a piezo-sensitive laminate especially for use in the present invention. This design includes a grid structure enabling different sizes and shapes of laminate to be cut from a large sheet to accommodate the different sizes and shapes of brake pedals – and still have the right connections for the laminate to work.